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## Demonstration of a Weed Management Expert System for Crop Production

Edward E. Schweizer  
*U.S. Department of Agriculture*

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## DEMONSTRATION OF A WEED MANAGEMENT EXPERT SYSTEM FOR CORN PRODUCTION

Edward E. Schweizer  
Plant Physiologist  
U.S. Department of Agriculture  
Agriculture Research Service

**Abstract.** The employment of a computer model to facilitate weed management decisions has the potential to reduce herbicide use when weed densities are below an economical threshold as opposed to applying prophylactic herbicide treatments in anticipation of weed problems. The computer model was constructed by linking two submodels representing soil-applied and postemergence weed management decisions. The models are farm specific, user friendly, and consider most herbicide options and herbicide efficacy by weed species. The submodels were developed in LOTUS.

The soil-applied decision submodel was designed to include as many as 40 grass and broadleaf weed species and 10 herbicide treatments. The current submodel includes 15 weed species, but only the 12 most numerous species are used in model analysis because the maximum number of weed species found on any farm has been eight. The number of weed seeds in soil is used as the control variable in the selection of soil-applied herbicides.

The postemergence decision submodel is linked to the soil-applied decision model. Weed densities, weed competitive index, and growth parameters for corn and weeds are used as the input variables in the selection of postemergence herbicides.

The demonstration will include inputting information on weed seedlings and corn plants, herbicide label requirements, economic data, and then projecting corn yield. Model output of gross revenue, postemergence costs, gross margin, and number of weighted weeds left to compete with corn will be displayed.